

CTR
TEG2 Board
User Manual

Nintendo
R&E

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1. CTR TEG2 Dev board overview



2. How to attach camera board

Step 1

Remove the spacers from the camera board



Step 2

Place the camera board like the screenshot below and insert it into the dev board.



Step3

Screw it at the bottom side of the dev board.



3. Power up and shut down

Step 1 for powering up

Connect Wii AC adapter



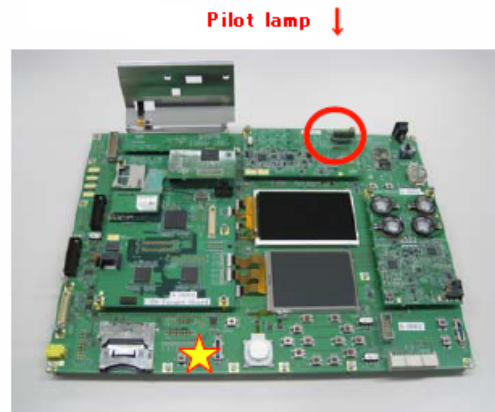
Step 2 for powering up

Turn on the main power switch on the motherboard. Once powering up, the red LED lights up. (When powering up and shutting down repeatedly and quickly, the dev board may not power up.)



Step 3 for powering up

Push POWER/HOME key, which corresponds to the power switch for production version, to activate it. The pilot lamp lights up when activated.



Shut down normally

Push POWER/HOME key on the mother board, then end it from the application menu.



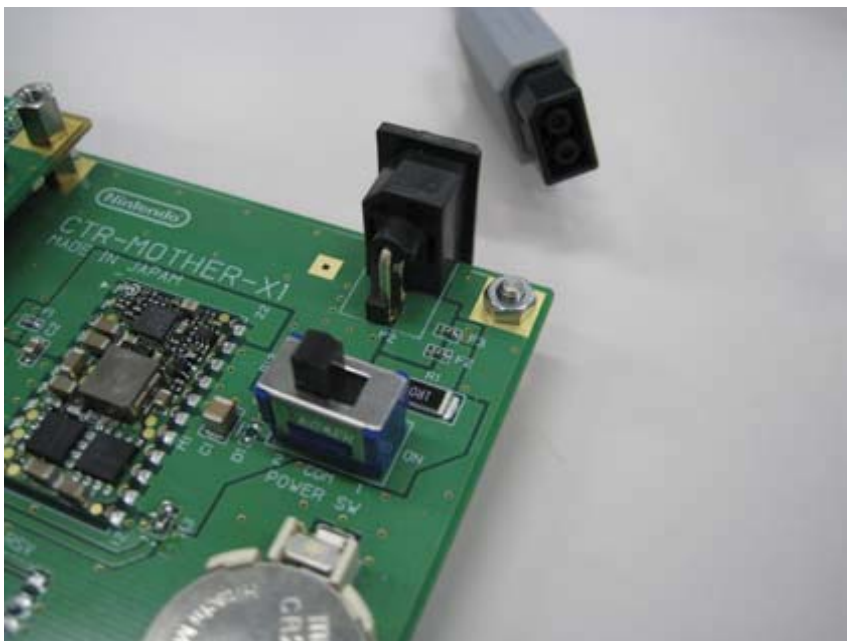
Shut down forcefully

Push and hold POWER/HOME key for several seconds.



Disconnect the main power

For safety, when not using it, unplug the AC adapter after turning off the main switch. Only turning off the main switch is insufficient.



4. Connecting the debugger and setting JTAG chain

4.1. CTR Debugger types and functions

ARM core debug is available for CTR debugger. It includes ROM emulator function and connects to the dev board with a single debug probe. The power to the debugger is supplied from the mother board. The debugger is designed by Kyoto Micro Computer Company and the followings types are available.

- CTR-JTAG debugger (available June 2009)
It connects to SoC (bonding option 01 and 10) with JATG I/F.
It's for SDK development.
- CTR-SPI debugger (available October 2009)
It connects to SoC (bonding option 10) with SPI I/F
It's for application development.

The following specific functions are available on these both debuggers:

- ROM emulation
- From debugger, switch between ROM emulation circuit and cartridge
- From debugger, turning off battery forcefully
- HOST IO functions using card bus

4.2. JTAG cascade connection

4.2.1. ARM core connection



4.2.2. Connecting device

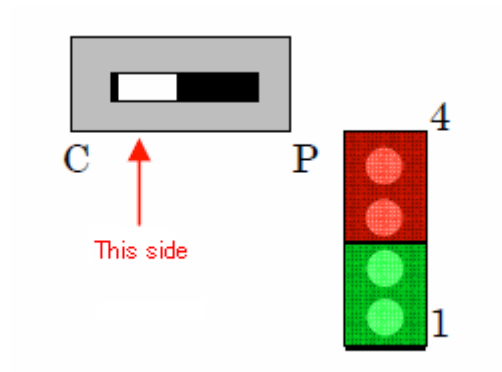


Connect CTR debugger probe like the screenshot above. Connect general probe like the screenshot below. Connect ARM's Real View ICE to the connector in the screenshot below. (The power to CTR debugger can be supplied by AC adapter.)



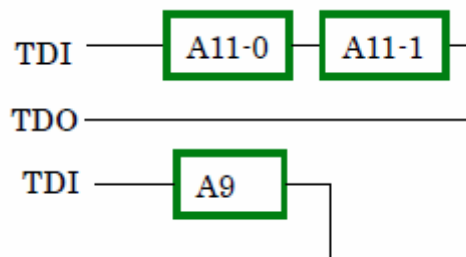
4.2.3. Setting JTAG chain

Set debug switch and jumper setting like below which is the default settings. Confirm the setting before powering up.

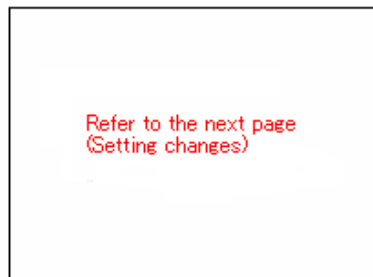


4.3. Using ARM9 and ARM11 with JTAG parallel connection or using debugger with multiple connections

4.3.1. ARM core connection



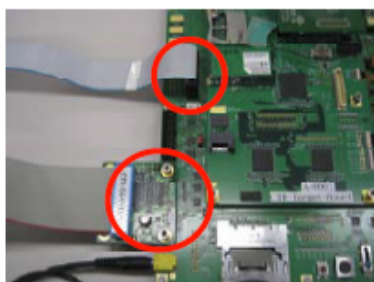
4.3.2. Connecting device



Connect only ARM11 with CTR probe



Connect only ARM9 with CTR probe



Connect both with CTR probe and general probe

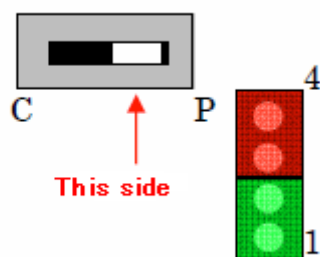


Connect with general probe



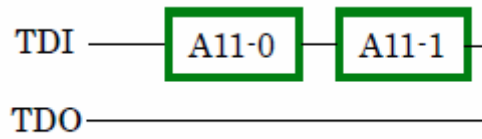
Connect with two of general probes

4.3.3. Setting JTAG chain



4.4. Using debugger with only ARM11 connected with CTR probe

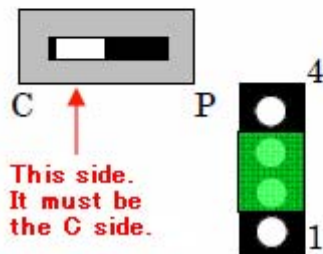
4.4.1. ARM core connection



4.4.2. Connecting device



4.4.3. Setting JTAG chain



Please note that if setting CLK setting to RCLK reference mode, ARM9 RCLK becomes a bottleneck. To set it to ARM CLK at the CLK fix mode leads to speeding up.

4.5. Using CTR-SPI debugger

Connect debug probe and power cable to the connector.



JTAG setting is ignored at CTR-SPI debug.

4.6. Using DSP debugger

Connect CEVA DSP JTAG BOX to the connector.



5. SoC new GPIO connection information

The new GPIO is connected to ARM11 AHB.

It consists of four of 1.8V IOs and eight of 3.3V IOs.

(The following input/output at the terminal should be referred from the SoC side.)

● 1.8V

GPIO3_180 (Input) Obtain key input from the headphone remote controller

GPIO3_181 (Input) Interrupt “irq0” for confirming status from micro controller

GPIO3_182 (Output) Rest signal to LCD module

GPIO3_183 (Input) DS_R6 (pen interrupt) from CODEC

● 3.3V

GPIO3_330 (Output) Switch signal between internal and external speaker

GPIO3_331 (Output) Reset signal to wireless module

GPIO3_332 (Input) Interrupt from IrDA module (modification and IrDA board needed)

GPIO3_333 (-) Reserved (connected to debugger)

GPIO3_334 (Output) Switch signal among touch panels of TWL CODEC1 and 2

GPIO3_335 (Output) Switch signal among microphones of TWL CODEC1 and 2

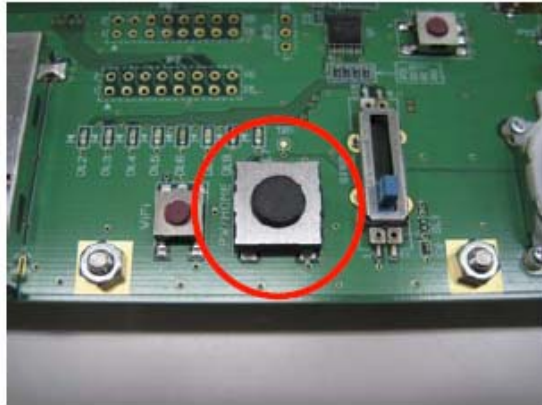
GPIO3_336 (Output) Signal to turn off the wireless module forcefully

GPIO3_337 (-) Not used

6. KEY and switch

6.1. POWER / HOME key

The POWER key for powering up also works as HOME key for calling the menu. It's a push switch.



6.2. Operational keys

There are 12 key inputs which are Up, Down, Right, Left, A, B, X, Y, L, R, START and SELECT. The SELECT key is also connected to the micro computer. They are push switches.



6.3. Analog key

There is an analog key for operation.



6.4. Switch for analog keys

Switch between on-board analog key and external analog controller. The on-board analog key is a default setting. It's a slide switch.



6.5. DEBUG button

It's used by debugger and connected to GPIO3_333. It's usually not used. It's a push switch.



6.6. Wireless ON/OFF switch

Switch ON/OFF for wireless. It can be a toggle switch by software. It's a push switch.



6.7. Volume for audio (switch)

It's a volume for audio. The switches are reserved. It's a slide volume.



6.8. Switch for sleep

Switch between sleep state and normal state. AWAKE means opened state, and SLEEP means closed state. AWAKE is a default setting. It's a slide switch.



6.9. Forced reset button

RESET1 becomes a reset state while pushing this button. It's released by releasing the button. It's a push switch.



6.10. Forced pulling out battery button

If pushing this button for X seconds, it simulates like pulling out the battery on a production version. Releasing the button leads to a simulated state which the battery is installed first time. (Leaving the button pushed causes a loss of the coin battery on the board, so it shouldn't be pushed for long time.) It's a push switch.



7. Extended functions

7.1. Extended ports

The followings are connected to the port and could be extensions on the production version.

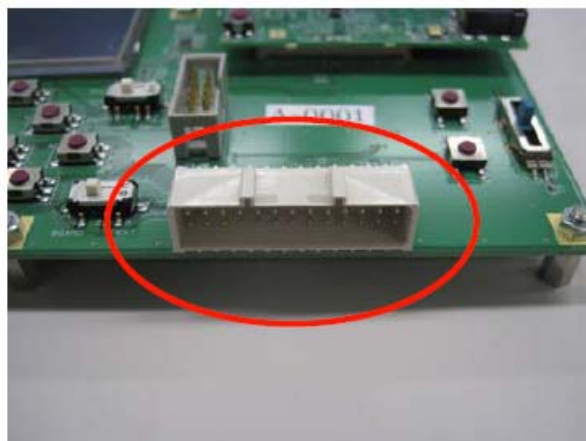
- SD31
- I2C-2
- Speaker output



7.2. External controller

The followings are connected to the port as external controller for input.

- Operational keys (They are OR-connected with the controller on the board.)
- Analog key (Refer to 6.4 for detail.)
- Acceleration sensor



7.3. SPI extension port

It's a port to extend unused SPI2-CS2 and CS3. SPI2 (only CS2 and CS3) is connected. IrDA can be connected with modification.



7.4. I2C extension port

It's a port to extend I2C-2. I2C-2 is connected. I2C debug board, which can display eight of 7 segments LED, can be connected optionally.

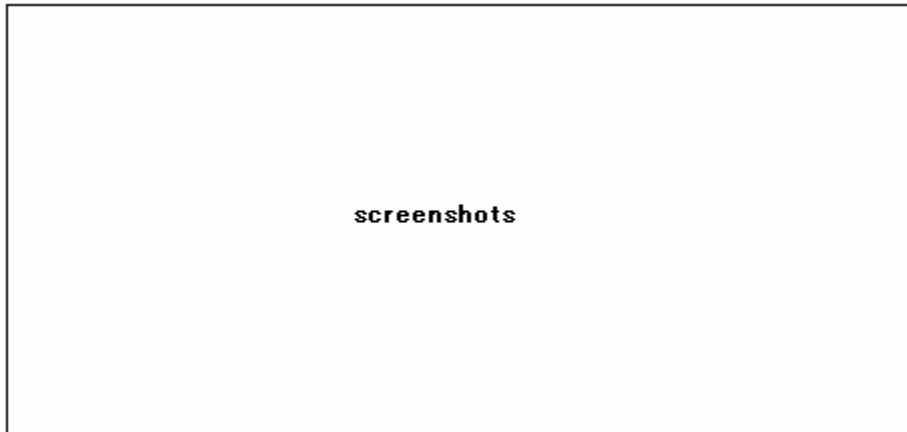


7.5. SoC core ammeter

An ammeter can be connected to 1V power line of ARM and the graphic processor. An ammeter can be mounted on the board. A programmer should be aware of current consumption (battery life) for the ECO campaign.



How to read current consumption:



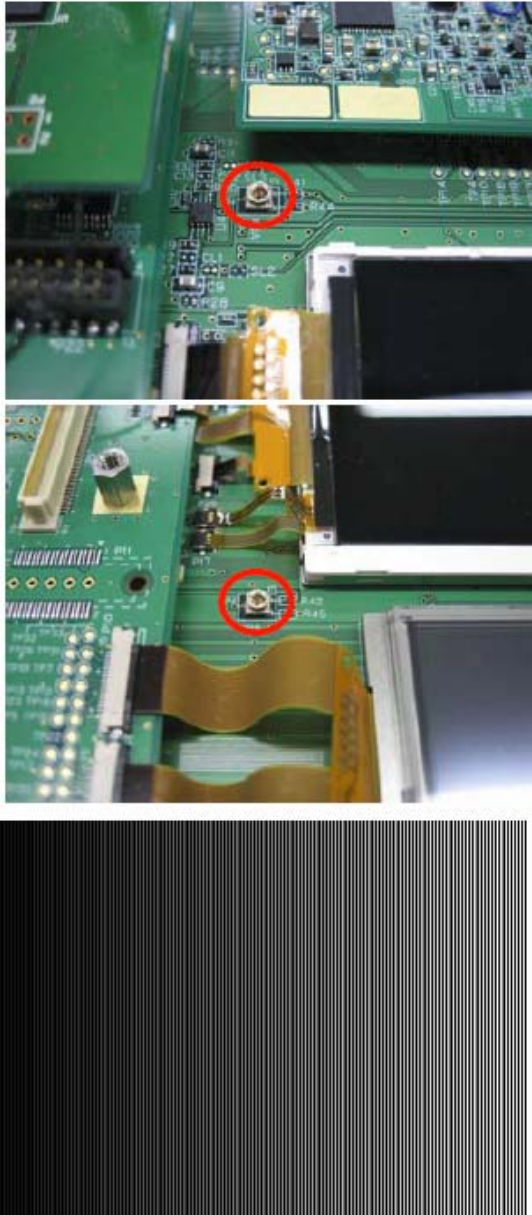
The screenshot shows current consumption in mA unit.

(Actually it shows a voltage for 0.1 ohm resistor, so current is computed by multiplying a displayed value by 10mV.)

8. Others

- Adjustment for LCD flicker

It should be adjusted at shipping, but it can be also adjusted with the volume using a plus driver. The flicker adjustment screen should be displayed when adjusting.



Adjustmetn screen



- Please contact a person in charge for detail of each device.
- When clock function is reset, the coin battery may run out.